

CLAIMS

1. A thermoelectric converter comprising:

an operating medium which is brought into contact
5 with one end portion of an electrolyte medium having ion conductivity, wherein the operating medium is connected to a first terminal and emits an electron or binds to an electron by oxidation or reduction, and

a permeable electrode which is brought into contact
10 with the other end portion of the electrolyte medium, wherein the permeable electrode is connected to a second terminal and allows the operating medium to permeate therethrough,

wherein the contact portion of the electrolyte medium
15 with the operating medium is disposed at a low-temperature side while the contact portion of the electrolyte medium with the permeable electrode is disposed at a high-temperature side, and

the contact portion of the electrolyte medium with
20 the operating medium and the contact portion of the electrolyte medium with the permeable electrode are set substantially under the same pressure.

2. The thermoelectric converter according to claim 1,
wherein the electrolyte medium comprises a solid
25 electrolyte material.

3. The thermoelectric converter according to claim 2,

wherein the solid electrolyte material is β " alumina.

4. The thermoelectric converter according to claim 1, wherein the electrolyte medium comprises electrolyte materials having different ion conductivity.

5 5. The thermoelectric converter according to claim 1, wherein the electrolyte medium comprises a hollow member which comprises a solid electrolyte material and is designed in a hollow shape or a tubular shape having a bottom, and a liquid electrolyte material introduced in the
10 hollow member.

6. The thermoelectric converter according to claim 5, wherein the solid electrolyte material is β " alumina.

7. The thermoelectric converter according to claim 5, wherein the liquid electrolyte material is a molten salt.

15 8. The thermoelectric converter according to claim 1, wherein the electrolyte medium comprises a liquid electrolyte material.

9. The thermoelectric converter according to claim 8, wherein the liquid electrolyte material is a molten salt.

20 10. The thermoelectric converter according to claim 1, wherein the operating medium is an alkali metal.

11. The thermoelectric converter according to claim 10, wherein the alkali metal is sodium.

25 12. The thermoelectric converter according to claim 1, wherein the operating medium is impregnated in an impregnation member.

13. A thermoelectric converter comprising:

an operating medium which is brought into contact with one end portion of an electrolyte medium having ion conductivity, wherein the operating medium is connected to
5 a first terminal and emits an electron or binds to an electron by oxidation or reduction, and

a permeable electrode which is brought into contact with the other end portion of the electrolyte medium, wherein the permeable electrode is connected to a second
10 terminal and allows the operating medium to permeate therethrough,

wherein the operating medium is vaporized at the permeable electrode while the operating medium is condensed at a condensing portion,

15 the contact portion of the electrolyte medium with the operating medium is disposed at a low-temperature side while the contact portion of the electrolyte medium with the permeable electrode is disposed at a high-temperature side, and

20 a pressure difference between the contact portion of the operating medium with the first terminal and the condensing portion is equal to or less than a vapor pressure difference of the operating medium which is caused by a temperature difference between the contact portion of
25 the operating medium with the first terminal and the condensing portion.

14. The thermoelectric converter according to claim 13, wherein a partition plate for separating both spaces of the contact portion of the electrolyte medium with the operating medium and the contact portion of the electrolyte medium with the permeable electrode is disposed between the contact portion of the electrolyte medium with the operating medium and the contact portion of the electrolyte medium with the permeable electrode.

15. The thermoelectric converter according to claim 13, wherein the contact portion of the electrolyte medium with the operating medium has a higher temperature than the condensing portion.

16. The thermoelectric converter according to claim 13, wherein the electrolyte medium comprises a solid electrolyte material.

17. The thermoelectric converter according to claim 13, wherein the operating medium is an alkali metal.

18. The thermoelectric converter according to claim 17, wherein the alkali metal is sodium.

19. The thermoelectric converter according to claim 13, wherein the operating medium is impregnated in an impregnation material.

20. The thermoelectric converter according to claim 13, wherein the electrolyte medium comprises electrolyte materials having different ion conductivity.

21. The thermoelectric converter according to claim

13, wherein the electrolyte medium comprises a hollow member which comprises a solid electrolyte material and is designed in a hollow shape or a tubular shape having a bottom, and a liquid electrolyte material introduced in the
5 hollow member.

22. The thermoelectric converter according to claim 21, wherein the solid electrolyte material is β'' alumina.